

CLAIMS:

1. A method comprising:
 - 2 detecting an amplitude of an oscillator signal generated by an oscillator during a calibration mode in which a phase lock loop is disabled;
 - 4 comparing the detected amplitude to a target amplitude; and adjusting the oscillator based on the comparison.
2. The method of claim 1, further comprising enabling a phase locked loop to control frequency of the oscillator after adjusting the oscillator.
3. The method of claim 1, wherein the oscillator comprises a voltage controlled oscillator with a configurable tail current source, wherein detecting the amplitude comprises detecting an output voltage amplitude of the VCO, and
4 wherein adjusting the oscillator comprises adjusting the configurable tail current source to achieve a desired output voltage amplitude.
4. The method of claim 3, wherein the a tail current source includes a set of
2 switched unit current sources, wherein adjusting the tail current source comprises selectively activating a subset of the switched unit current sources.
5. The method of claim 4, wherein selectively activating the subset of the
2 switched unit current sources comprises de-activating switched unit current sources in discrete steps until the output voltage amplitude would fall below the
4 target amplitude.
6. The method of claim 1, further comprising selecting the desired target
2 amplitude based on an operation mode of a wireless communication device implementing the oscillator.
7. The method of claim 1, further comprising adjusting discrete circuitry of
2 the oscillator that affects a frequency of the oscillator prior to enabling a phase locked loop.

8. The method of claim 1, wherein detecting the amplitude comprises
2 generating a DC voltage indicative of the amplitude of an oscillator signal, and
wherein comparing the detected amplitude to a target amplitude comprises
4 comparing the generated DC voltage to a target DC voltage.

9. A method of calibrating an amplitude of an oscillator comprising:
2 setting a configurable tail current source of the oscillator to a maximum
current setting; and
4 reducing the current setting of the configurable tail current source in
discrete steps until the amplitude of the oscillator would fall below a target.

10. The method of claim 9, wherein reducing the current setting of the
2 configurable tail current source in discrete steps comprises de-activating switched
unit current sources in discrete steps.

11. The method of claim 9, further comprising selecting the target based on a
2 mode of operation of a wireless communication device implementing the
oscillator.

12. A frequency synthesizer comprising:
2 an oscillator including a configurable tail current source;
a phase locked loop that controls a frequency of an oscillating signal of
4 the oscillator; and
an amplitude calibration unit that calibrates the configurable tail current
6 source when the phase locked loop is disabled in order to achieve a desired
amplitude for the oscillating signal.

13. The frequency synthesizer of claim 12, wherein the oscillator comprises a
2 voltage controlled oscillator, and the configurable tail current source comprises a
number of switched unit current sources, wherein the amplitude calibration unit
4 detects a voltage amplitude of the oscillator and adjusts the configurable tail
current source by activating a subset of the switched unit current sources to
6 achieve the desired voltage amplitude of the oscillator.

14. The frequency synthesizer of claim 13, wherein the amplitude calibration
unit activates the subset of switched unit current sources by de-activating
switched unit current sources in discrete steps until voltage amplitude of the
oscillator would fall below a target.

15. The frequency synthesizer of claim 12, wherein the frequency synthesizer
enables the phase locked loop following calibration of the configurable tail
current source.

16. The frequency synthesizer of claim 12, wherein the oscillator includes
additional configurable circuitry that affects the frequency of the oscillator,
wherein the frequency synthesizer further comprises a frequency calibration unit
that adjusts the additional configurable circuitry of the oscillator to adjust the
frequency of the oscillator when the phase locked loop is disabled.

17. A frequency synthesizer comprising:
an oscillator including a configurable tail current source;
circuitry that sets the configurable tail current source of the oscillator to a
maximum current setting; and
circuitry that reduces the current setting of the configurable tail current
source in discrete steps until an oscillating signal of the oscillator is below a
target.

18. The frequency synthesizer of claim 17, wherein the circuitry that reduces
the current setting reduces the current setting in discrete steps by de-activating
switched unit current sources in discrete steps.

19. The frequency synthesizer of claim 17, further comprising circuitry that
selects the target based on a mode of operation of a wireless communication
device implementing the oscillator.

20. A wireless communication device comprising:
frequency synthesizer that generates waveforms, wherein the frequency
synthesizer comprises an oscillator including a configurable tail current source, a

- 4 phase locked loop that controls a frequency of an oscillating signal of the
oscillator, and an amplitude calibration unit that calibrates the configurable tail
6 current source when the phase locked loop is disabled in order to achieve a
desired amplitude of the oscillating signal; and
8 a mixer that mixes the waveforms.

21. The wireless communication device of claim 20, further comprising a
2 receiver that receives RF waveforms, wherein the mixer down-mixes the received
RF waveforms to a baseband signal using the waveforms generated by the
4 frequency synthesizer as a timing reference.

22. The wireless communication device of claim 20, further comprising a
2 transmitter that transmits the waveforms, wherein the mixer modulates baseband
signals into the waveforms prior to transmission.

23. A wireless communication device comprising:
2 frequency synthesizer that generates waveforms, wherein the frequency
synthesizer comprises an oscillator including a configurable tail current source,
4 circuitry that sets the configurable tail current source of the oscillator to a
maximum current setting, and circuitry that reduces the current setting of the
6 configurable tail current source in discrete steps until an oscillating signal of the
oscillator is below a target; and
8 a mixer that mixes the waveforms.

24. The wireless communication device of claim 23, further comprising a
2 receiver that receives RF waveforms, wherein the mixer down-mixes the received
RF waveforms to a baseband signal using the waveforms generated by the
4 frequency synthesizer as a timing reference.

25. The wireless communication device of claim 23, further comprising a
2 transmitter that transmits the waveforms, wherein the mixer modulates baseband
signals into the waveforms prior to transmission.

26. An apparatus comprising:

- 2 circuitry that detects a signal amplitude of an oscillator for an input
parameter prior to enabling a phase locked loop; and
4 circuitry that adjusts the oscillator to achieve a desired signal amplitude.

27. The apparatus of claim 26, wherein the oscillator comprises a voltage
2 controlled oscillator that includes a configurable tail current source comprising a
set of switched unit current sources, wherein the circuitry that adjusts the
4 oscillator selectively activates a subset of the switched unit current sources to
achieve the desired signal amplitude.

28. The apparatus of claim 26, wherein the circuitry that adjusts the oscillator
2 selectively activates the subset by de-activating switched unit current sources in
discrete steps until signal amplitude of the oscillator is below a target.

29. The apparatus of claim 26, further comprising circuitry that selects the
2 desired signal amplitude based on an operation mode of a wireless
communication device implementing the oscillator.

30. The apparatus of claim 26, further comprising:
2 circuitry that calibrates a signal frequency of the oscillator; and
 circuitry that enables the phase locked loop after adjusting the oscillator to
4 achieve a desired signal amplitude and after calibrating the signal frequency of
the oscillator.

31. An apparatus comprising:
2 circuitry that sets a configurable tail current source of an oscillator to a
maximum current setting; and
4 circuitry that reduces the current setting of the configurable tail current
source in discrete steps until an amplitude of an oscillating signal of the oscillator
6 is below a target.

32. The apparatus of claim 31, wherein the configurable tail current source
2 includes a set of switched unit current sources, wherein the circuitry that reduces

- the current setting of the adjustable tail current source in discrete steps
- 4 de-activates the switched unit current sources in discrete steps.

33. The apparatus of claim 31, further comprising circuitry that selects the
2 target based on a mode of operation of a wireless communication device
implementing the apparatus.

34. A frequency synthesizer comprising:
2 an oscillator;
means for disabling a phase locked loop of an oscillator;
4 means for detecting a signal amplitude of the oscillator for an input
parameter when the phase locked loop is disabled; and
6 means for adjusting the oscillator to achieve a desired signal amplitude.

35. The frequency synthesizer of claim 34, wherein the oscillator includes a
2 configurable tail current source, wherein the means for adjusting comprises a set
of switched unit current sources in the tail current source.

36. A frequency synthesizer comprising:
2 an oscillator including a configurable tail current source;
means for setting the configurable tail current source of the oscillator to a
4 maximum current setting; and
means for reducing the current setting of the configurable tail current
6 source in discrete steps until an amplitude of a signal of the oscillator would be
below a target.

37. The frequency synthesizer of claim 36, wherein in the means for reducing
2 comprises a set of switched unit current sources.

38. The frequency synthesizer of claim 36, further comprising means for
2 selecting the target based on a mode of operation of a wireless communication
device implementing the frequency synthesizer.

39. An oscillator comprising:

- 2 an oscillator tank that generates an oscillating voltage signal; and
a configurable tail current source that defines an amplitude of the
4 oscillating voltage signal, wherein the configurable tail current source includes a
set of switched unit current sources that can be selectively activated to adjust the
6 amplitude.